

FCC RADIO TEST REPORT

according to

47 CFR FCC Part 15 Subpart C § 15.225

Equipment : Point of Sale Terminal
Brand Name : VeriFone
Model No. : VX520/VX520G
Filing Type : New Application
Applicant : VeriFone Inc.
Manufacturer : 1400 West Stanford Ranch Road
Suit 200 Rocklin CA 95765 USA
FCC ID : B32VX520GPRSC TLS
Received Date : Sep. 06, 2011
Final Test Date : Jan. 17, 2012

Statement

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.4-2003** and **47 CFR FCC Part 15 Subpart C**.

The test equipment used to perform the test is calibrated and traceable to NML/ROC.



SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

Table of Contents

1. SUMMARY OF THE TEST RESULT	2
2. GENERAL INFORMATION.....	3
2.1 Product Details.....	3
2.2 Accessories	3
2.3 Table for Test Modes.....	3
2.4 Table for Testing Locations.....	3
2.5 Table for Supporting Units	3
2.6 Test Configurations.....	4
3. TEST RESULT	6
3.1 AC Power Line Conducted Emissions Measurement	6
3.2 Field Strength of Fundamental Emissions and Mask Measurement.....	12
3.3 20dB Spectrum Bandwidth Measurement	15
3.4 Radiated Emissions Measurement	17
3.5 Frequency Stability Measurement	28
3.6 Antenna Requirements	30
4. LIST OF MEASURING EQUIPMENTS	31
5. TEST LOCATION.....	33
6. TAF CERTIFICATE OF ACCREDITATION.....	34
APPENDIX A. TEST PHOTOS	A1 ~ A8
APPENDIX B. PHOTOGRAPHS OF EUT	B1 ~ B20

CERTIFICATE OF COMPLIANCE

according to

47 CFR FCC Part 15 Subpart C § 15.225

Equipment : Point of Sale Terminal

Brand Name : VeriFone

Model No. : VX520/VX520G

Applicant : VeriFone Inc.

1400 West Stanford Ranch Road Suit 200
Rocklin CA 95765 USA

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Sep. 06, 2011 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Wayne Hsu / Assistant Manager

SPORTON International Inc.

No. 52 Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.

1. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart C				
Part	Rule Section	Description of Test	Result	Under Limit
3.1	15.207	AC Power Line Conducted Emissions	Complies	3.98 dB
3.2	15.225(a)	Field Strength of Fundamental Emissions	Complies	40.88 dB
3.3	15.215(c)	20dB Spectrum Bandwidth	Complies	-
3.4	15.225(d)	Radiated Emissions	Complies	-
3.5	15.225(e)	Frequency Stability	Complies	-
3.6	15.203	Antenna Requirements	Complies	-

Test Items	Uncertainty	Remark
AC Power Line Conducted Emissions	±2.3dB	Confidence levels of 95%
Field Strength of Fundamental Emissions	±0.8dB	Confidence levels of 95%
20dB Spectrum Bandwidth / Frequency Stability	±8.5×10 ⁻⁸	Confidence levels of 95%
Radiated / Band Edge Emissions (9kHz~30MHz)	±0.8dB	Confidence levels of 95%
Radiated Emissions (30MHz~1000MHz)	±1.9dB	Confidence levels of 95%
Temperature	±0.7°C	Confidence levels of 95%
Humidity	±3.2%	Confidence levels of 95%
DC / AC Power Source	±1.4%	Confidence levels of 95%

2. GENERAL INFORMATION

2.1 Product Details

Items	Description
Power Type	9.3 Vdc from AC Adapter ; 7.2Vdc from Li-ion battery
Modulation	ASK
Channel Number	1
Channel Band Width (99%)	2.26 kHz
Max. Field Strength	62.20 dBuV/m at 10m (QP)
Test Freq. Range	13.553 ~ 13.567MHz
Carrier Frequencies	13.56 MHz (Ch. 1)
Antenna	Integrate Antenna (Without any antenna connector)

2.2 Accessories

Accessories Information					
Accessories or 2nd Source or Key Part	AC Adapter 1	Brand Name	VeriFone	Model Name	CAE036092
		Power Rating	I/P: 100-240Vac, 1200mA, O/P: 9.3Vdc, 4A		
	AC Adapter 2	Brand Name	VeriFone	Model Name	SM09003A
		Power Rating	I/P: 100-240Vac, 2A, O/P: 9.3Vdc, 4A		
	Battery 1 (Palladium Energy)	Brand Name	VeriFone	Model Name	24016-01-R
		Power Rating	7.2 Vdc, 1800mAh	Type	Li-ion
	Battery 2 (SANYO)	Brand Name	NXP	Model Name	PN512
		Power Rating	7.2 Vdc, 1800mAh	Type	Li-ion
	Battery 3 (Samsung)	Brand Name	VeriFone	Model Name	24016-01-R
		Power Rating	7.2 Vdc, 1800mAh	Type	Li-ion
	2G Module	Brand Name	Cinterion	Model Name	MC55i

2.3 Table for Test Modes

Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Channel
AC Power Line Conducted Emissions	Transmitting mode	-
Field Strength of Fundamental Emissions	CTX	1
20dB Spectrum Bandwidth	CTX	1
Radiated Emissions 9kHz~30MHz	CTX	1
Radiated Emissions 9kHz~10 th Harmonic Band Edge Emissions	CTX	1
Frequency Stability	Un-modulation	1

Note: CTX=continuously transmitting.

2.4 Table for Testing Locations

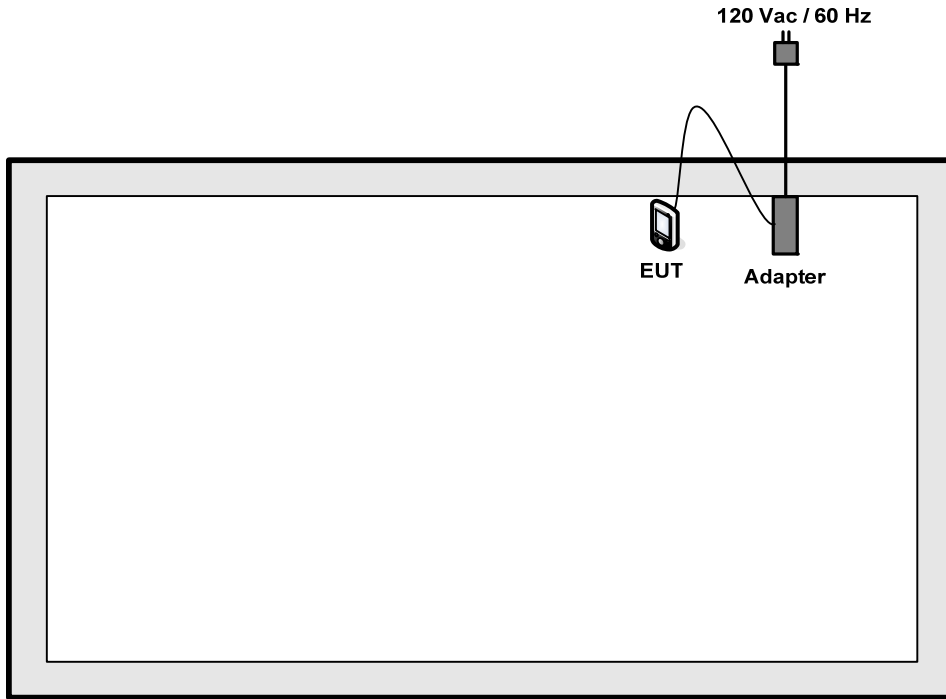
Test Site No.	Site Category	Location
CO04-HY	Conduction	Hwa Ya
TH01-HY	OVEN Room	Hwa Ya
10CH02-HY	SAC	Hwa Ya
03CH02-HY	SAC	Hwa Ya

Semi Anechoic Chamber (SAC).

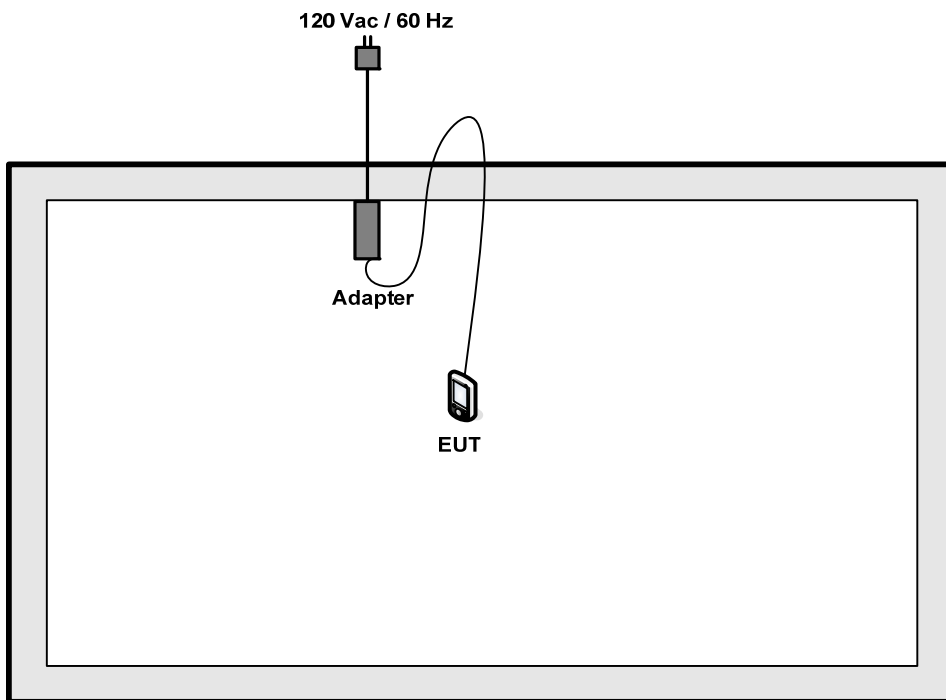
2.5 Table for Supporting Units

The EUT was tested alone.

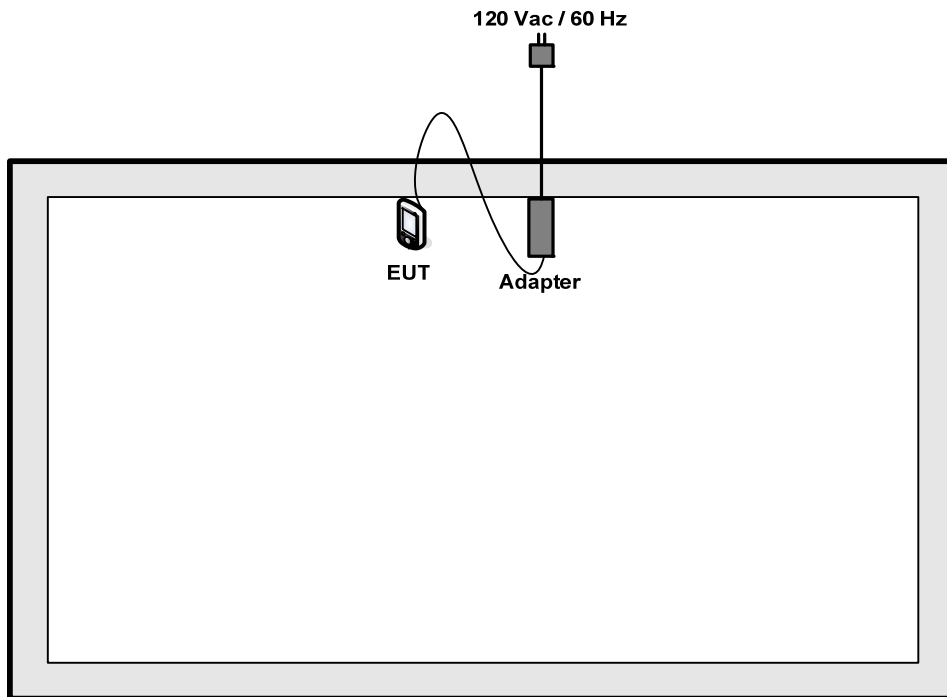
2.6 Test Configurations
For Conducted Emissions



For radiated emissions 9kHz~30MHz



For radiated emissions 30MHz~1GHz



3. TEST RESULT

3.1 AC Power Line Conducted Emissions Measurement

3.1.1 Limit

For a Low-power Radio-frequency device which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

3.1.2 Measuring Instruments and Setting

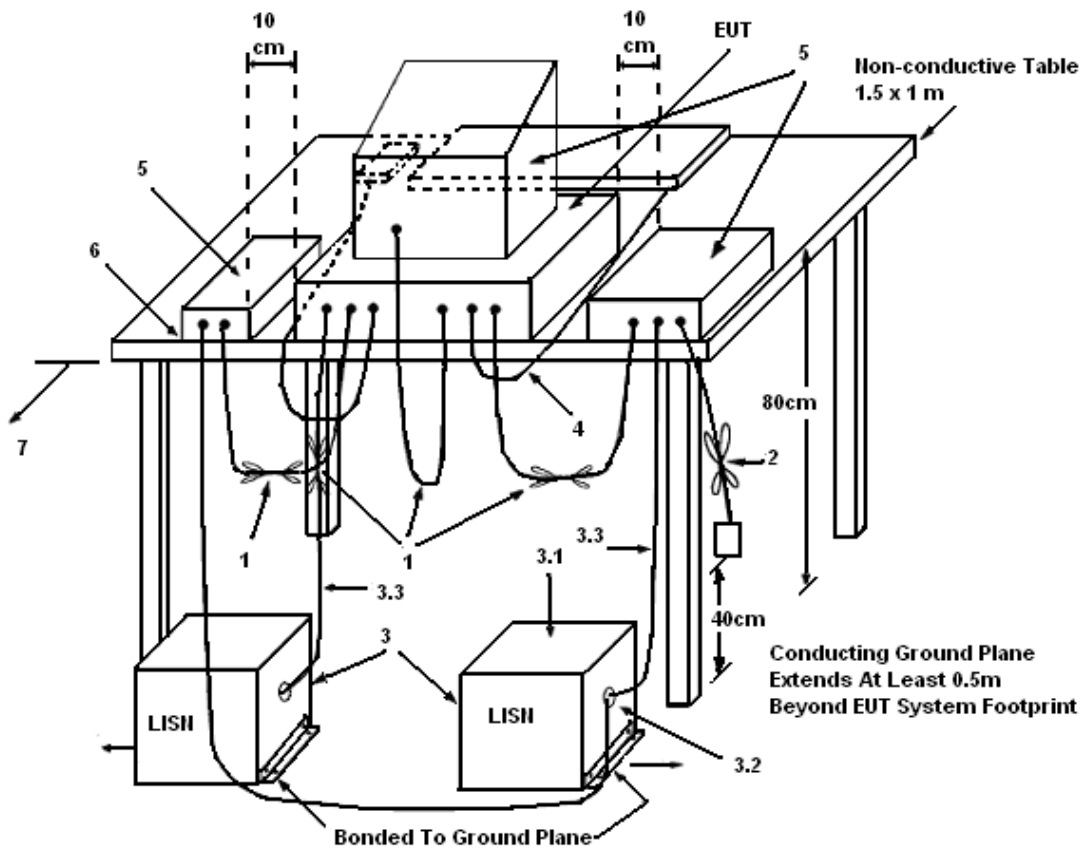
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

3.1.3 Test Procedures

1. The EUT warm up about 15 minutes then start test.
2. Configure the EUT according to ANSI C63.4. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
5. The frequency range from 150 KHz to 30 MHz was searched.
6. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
7. The measurement has to be done between each power line and ground at the power terminal.

3.1.4 Test Setup Layout



LEGEND:

- (1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- (2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- (3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.
- (3.1) All other equipment powered from additional LISN(s).
- (3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
- (3.3) LISN at least 80 cm from nearest part of EUT chassis.
- (4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.
- (5) Non-EUT components of EUT system being tested.
- (6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.
- (7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

3.1.5 Test Deviation

There is no deviation with the original standard.

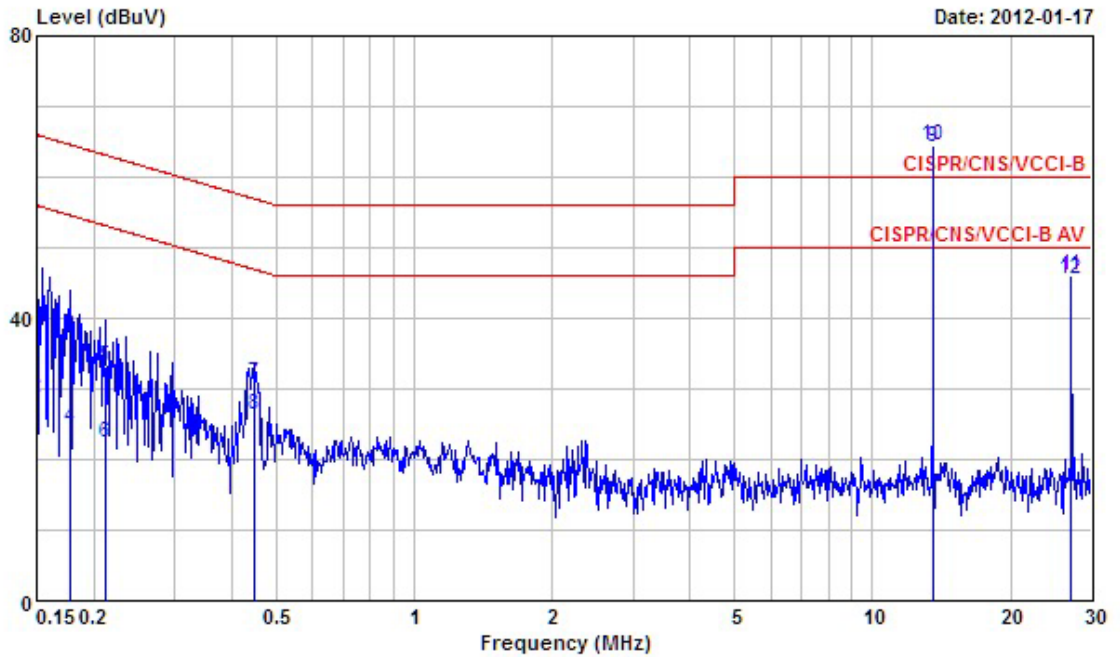
3.1.6 EUT Operation during Test

The EUT was placed on the test table and programmed in transmitting mode.

3.1.7 Results of AC Power Line Conducted Emissions Measurement

Final Test Date	Jan. 17, 2012	Test Site No.	CO04-HY
Temperature	24.1°C	Humidity	49%
Test Engineer	Assen	Configuration	Transmitting mode (AC Adapter 1 / CAE036092)

Line



Line

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.1500000	42.73	-23.27	66.00	42.17	0.30	0.26	QP
2	0.1500000	28.57	-27.43	56.00	28.01	0.30	0.26	Average
3	0.1767760	37.70	-26.94	64.64	37.12	0.30	0.28	QP
4	0.1767760	24.39	-30.25	54.64	23.81	0.30	0.28	Average
5	0.2116700	33.06	-30.08	63.14	32.48	0.30	0.28	QP
6	0.2116700	22.37	-30.77	53.14	21.79	0.30	0.28	Average
7	0.4491640	30.83	-26.06	56.89	30.53	0.29	0.01	QP
8	0.4491640	26.21	-20.68	46.89	25.91	0.29	0.01	Average
9 X	13.560	64.26	4.26	60.00	63.60	0.51	0.15	QP
10 X	13.560	64.56	14.56	50.00	63.90	0.51	0.15	Average
11	27.120	46.02	-3.98	50.00	45.12	0.66	0.24	Average
12	27.120	45.65	-14.35	60.00	44.75	0.66	0.24	QP

Note: Items 9 and 10 frequency is RF signal.

Neutral

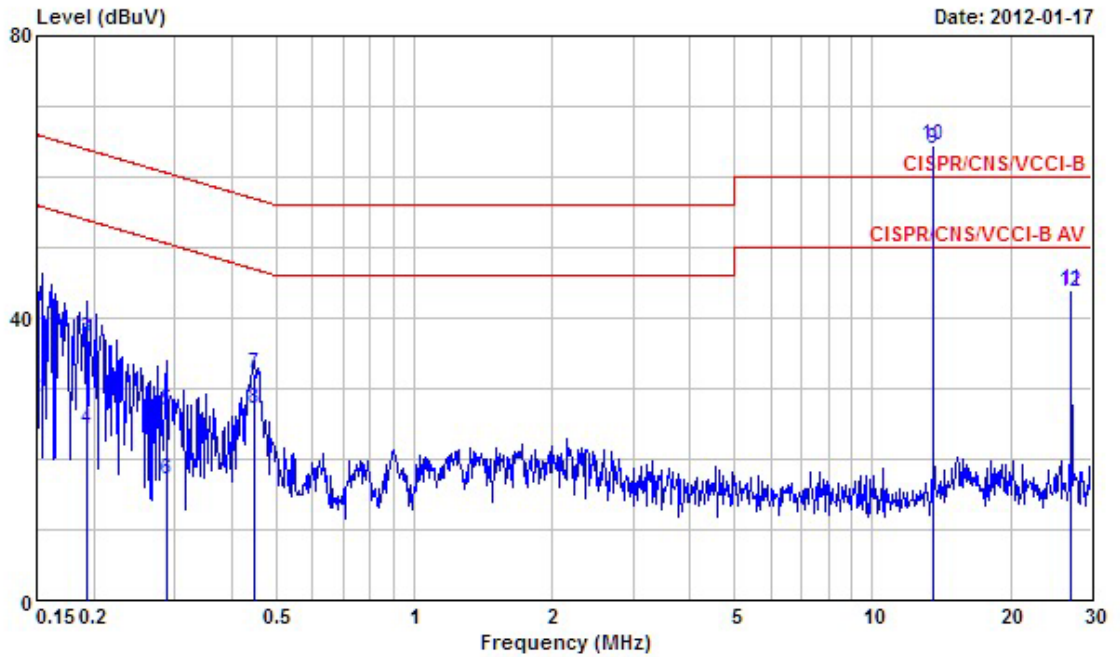


Figure 1: Neutral

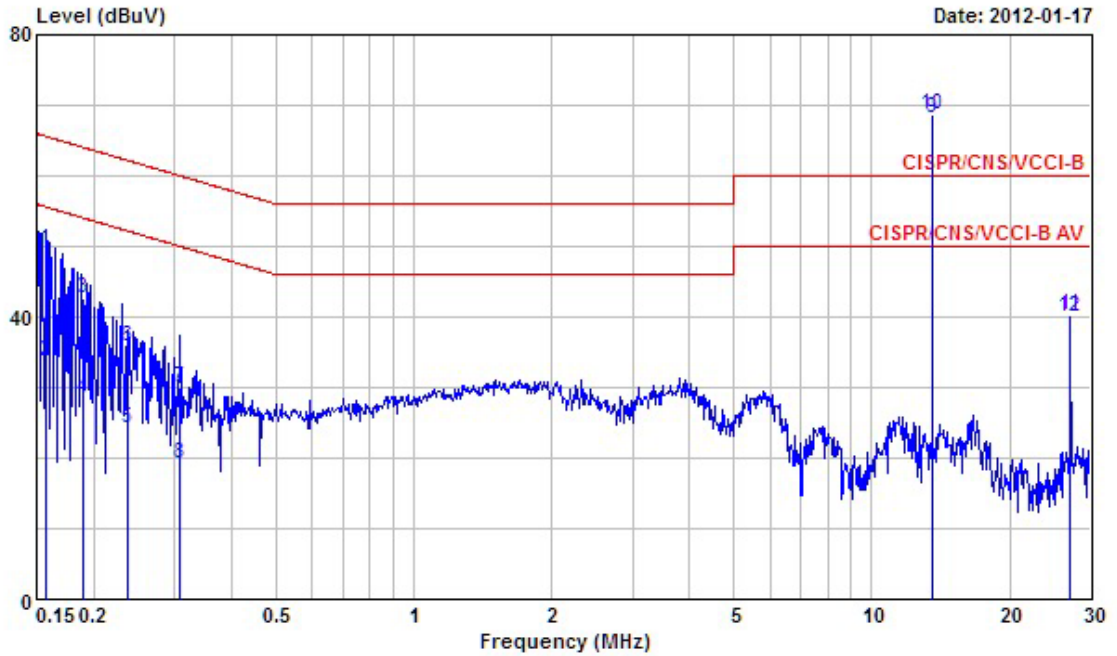
Table 1: Data

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.1500000	42.83	-23.17	66.00	42.30	0.27	0.26	QP
2	0.1500000	28.63	-27.37	56.00	28.10	0.27	0.26	Average
3	0.1934380	37.21	-26.68	63.89	36.66	0.25	0.30	QP
4	0.1934380	24.12	-29.77	53.89	23.57	0.25	0.30	Average
5	0.2878180	26.83	-33.76	60.59	26.45	0.24	0.14	QP
6	0.2878180	17.01	-33.58	50.59	16.63	0.24	0.14	Average
7	0.4491640	31.99	-24.90	56.89	31.74	0.24	0.01	QP
8	0.4491640	27.12	-19.77	46.89	26.87	0.24	0.01	Average
9 X	13.560	63.98	3.98	60.00	63.40	0.43	0.15	QP
10 X	13.560	64.35	14.35	50.00	63.77	0.43	0.15	Average
11	27.120	43.94	-6.06	50.00	43.15	0.55	0.24	Average
12	27.120	43.56	-16.44	60.00	42.77	0.55	0.24	QP

Note: Items 9 and 10 frequency is RF signal.
 Level = Read Level + LISN Factor + Cable Loss.

Final Test Date	Jan. 17, 2012	Test Site No.	CO04-HY
Temperature	24.1°C	Humidity	49%
Test Engineer	Assen	Configuration	Transmitting mode (AC Adapter 2 / SM09003A)

Line

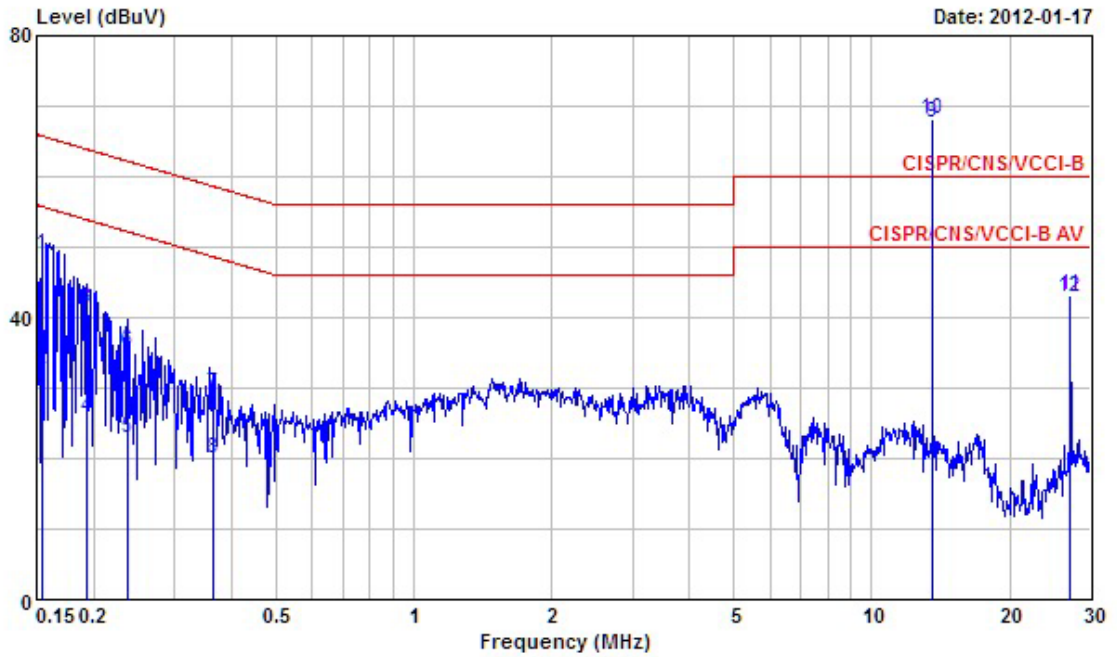


0.15 0.2 0.5 1 2 5 10 20 30

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.1564950	49.54	-16.11	65.65	48.98	0.30	0.26	QP
2	0.1564950	33.58	-22.07	55.65	33.02	0.30	0.26	Average
3	0.1895340	42.73	-21.33	64.06	42.14	0.30	0.29	QP
4	0.1895340	28.48	-25.58	54.06	27.89	0.30	0.29	Average
5	0.2365810	24.11	-28.11	52.22	23.58	0.30	0.23	Average
6	0.2365810	35.90	-26.32	62.22	35.37	0.30	0.23	QP
7	0.3083410	29.88	-30.14	60.02	29.47	0.30	0.11	QP
8	0.3083410	19.16	-30.86	50.02	18.75	0.30	0.11	Average
9 X	13.560	68.26	8.26	60.00	67.60	0.51	0.15	QP
10 §	13.560	68.70	18.70	50.00	68.04	0.51	0.15	Average
11	27.120	40.21	-9.79	50.00	39.31	0.66	0.24	Average
12	27.120	40.02	-19.98	60.00	39.12	0.66	0.24	QP

Note: Items 9 and 10 frequency is RF signal.

Neutral



0.15 0.2 0.5 1 2 5 10 20 30

0.15 0.2 0.5 1 2 5 10 20 30

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1	0.1548450	49.01	-16.73	65.74	48.48	0.27	0.26	QP
2	0.1548450	32.55	-23.19	55.74	32.02	0.27	0.26	Average
3	0.1934380	41.44	-22.45	63.89	40.89	0.25	0.30	QP
4	0.1934380	25.68	-28.21	53.89	25.13	0.25	0.30	Average
5	0.2365810	22.79	-29.43	52.22	22.31	0.25	0.23	Average
6	0.2365810	35.37	-26.85	62.22	34.89	0.25	0.23	QP
7	0.3639020	29.31	-29.33	58.64	29.03	0.24	0.04	QP
8	0.3639020	19.98	-28.66	48.64	19.70	0.24	0.04	Average
9 X	13.560	67.61	7.61	60.00	67.03	0.43	0.15	QP
10 ♂	13.560	68.16	18.16	50.00	67.58	0.43	0.15	Average
11	27.120	43.14	-6.86	50.00	42.35	0.55	0.24	Average
12	27.120	42.81	-17.19	60.00	42.02	0.55	0.24	QP

Note: Items 9 and 10 frequency is RF signal.
Level = Read Level + LISN Factor + Cable Loss.

3.2 Field Strength of Fundamental Emissions and Mask Measurement

3.2.1 Limit

Field strength of fundamental emissions limit:

The field strength of fundamental emissions shall not exceed 15848 micorvolts/meter at 30 meters. The emissions limit in this paragraph is based on measurement instrumentation employing a QP detector.

Frequencies (MHz)	Field Strength (micorvolts/meter)	Field Strength (dBµV/m) at 10m	Field Strength (dBµV/m) at 3m
13.553 ~ 13.567MHz	15848 at 30m	103.08 (QP)	124 (QP)

Mask limit:

Rules and specifications		CFR 47 Part 15 section 15.225(a)-(d)			
Description	Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1kHz for the band 13.553~13.567MHz				
Limit	Freq. of Emission (MHz)	Field Strength (uV/m) at 30m	Field Strength (dBuV/m) at 30m	Field Strength (dBuV/m) at 10m	Field Strength (dBuV/m) at 3m
	1.705~13.110	30	29.5	48.58	69.5
	13.110~13.410	106	40.5	59.58	80.5
	13.410~13.553	334	50.5	69.58	90.5
	13.553~13.567	15848	84.0	103.08	124.0
	13.567~13.710	334	50.5	69.58	90.5
	13.710~14.010	106	40.5	59.58	80.5
14.010~30.000	30	29.5	48.58	69.5	

3.2.2 Measuring Instruments and Setting

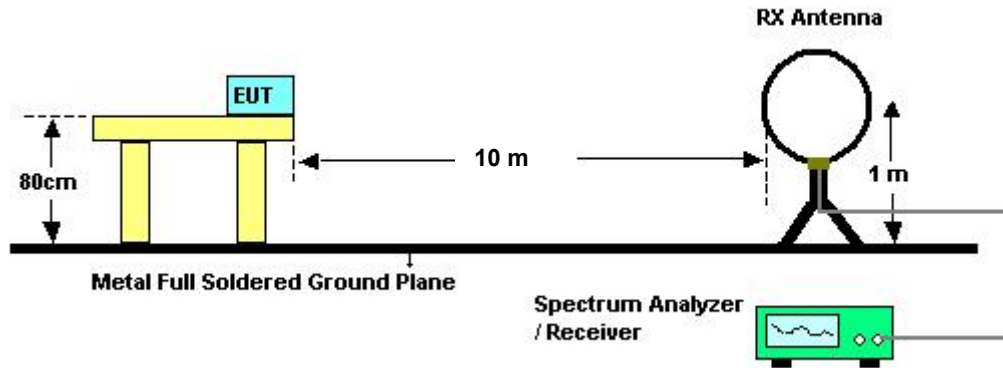
Please refer to section 4 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameter	Setting
Attenuation	Auto
Center Frequency	Fundamental Frequency
RB	9 kHz
Detector	QP

3.2.3 Test Procedures

1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the loop receiving antenna mounted antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the receiving antenna was fixed at one meter above ground to find the maximum emissions field strength.
4. For Fundamental emissions, use the receiver to measure QP reading.
5. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
6. Compliance with the spectrum mask is tested using a spectrum analyzer with RB set to a 1kHz for the band 13.553~13.567MHz.

3.2.4 Test Setup Layout



3.2.5 Test Deviation

There is no deviation with the original standard.

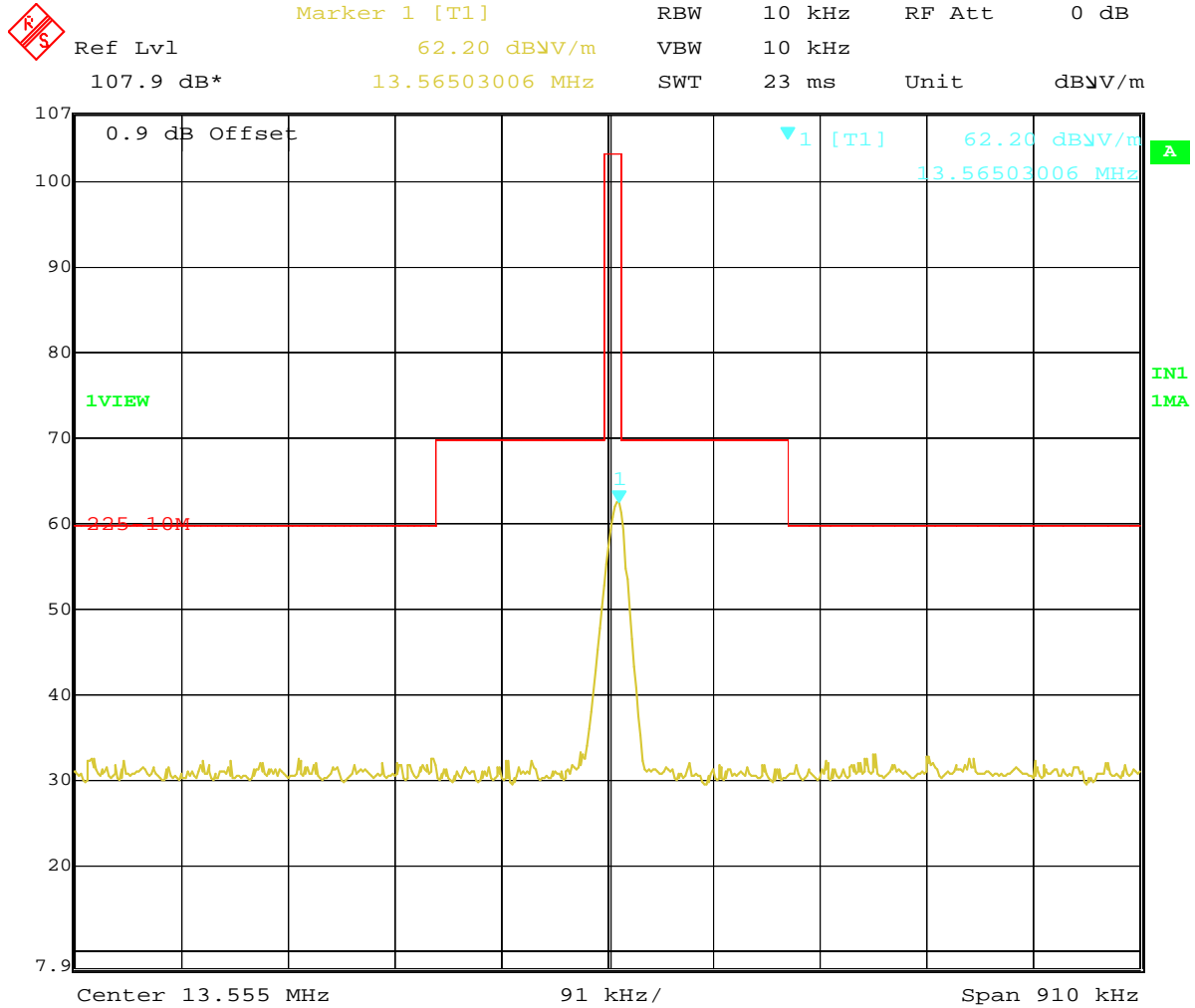
3.2.6 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

3.2.7 Test Result of Field Strength of Fundamental Emissions

Final Test Date	Jan. 16, 2012	Test Site No.	10CH02-HY
Temperature	21.2°C	Humidity	66%
Test Engineer	Streak	Configurations	Ch. 1

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m) at 10m	Remark
13.56 MHz	62.20	-40.88	103.08	QP



Date: 16.JAN.2012 20:27:13

Note:
 Emission level (dBuV/m) = 20 log Emission level (uV/m).
 Distance extrapolation factor = 40 log (specific distance / test distance) (dB);
 Limit line = specific limits (dBuV) + distance extrapolation factor.

3.3 20dB Spectrum Bandwidth Measurement

3.3.1 Limit

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emissions in the specific band (13.553 ~ 13.567MHz).

3.3.2 Measuring Instruments and Setting

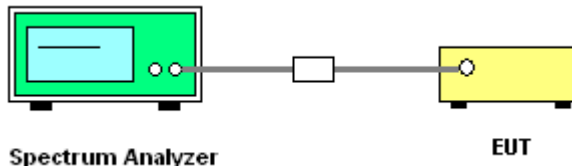
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 20dB Bandwidth
RB	1 kHz
VB	1 kHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

3.3.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer in peak hold mode.
2. The resolution bandwidth of 1 kHz and the video bandwidth of 1 kHz were used.
3. Measured the spectrum width with power higher than 20dB below carrier.

3.3.4 Test Setup Layout



3.3.5 Test Deviation

There is no deviation with the original standard.

3.3.6 EUT Operation during Test

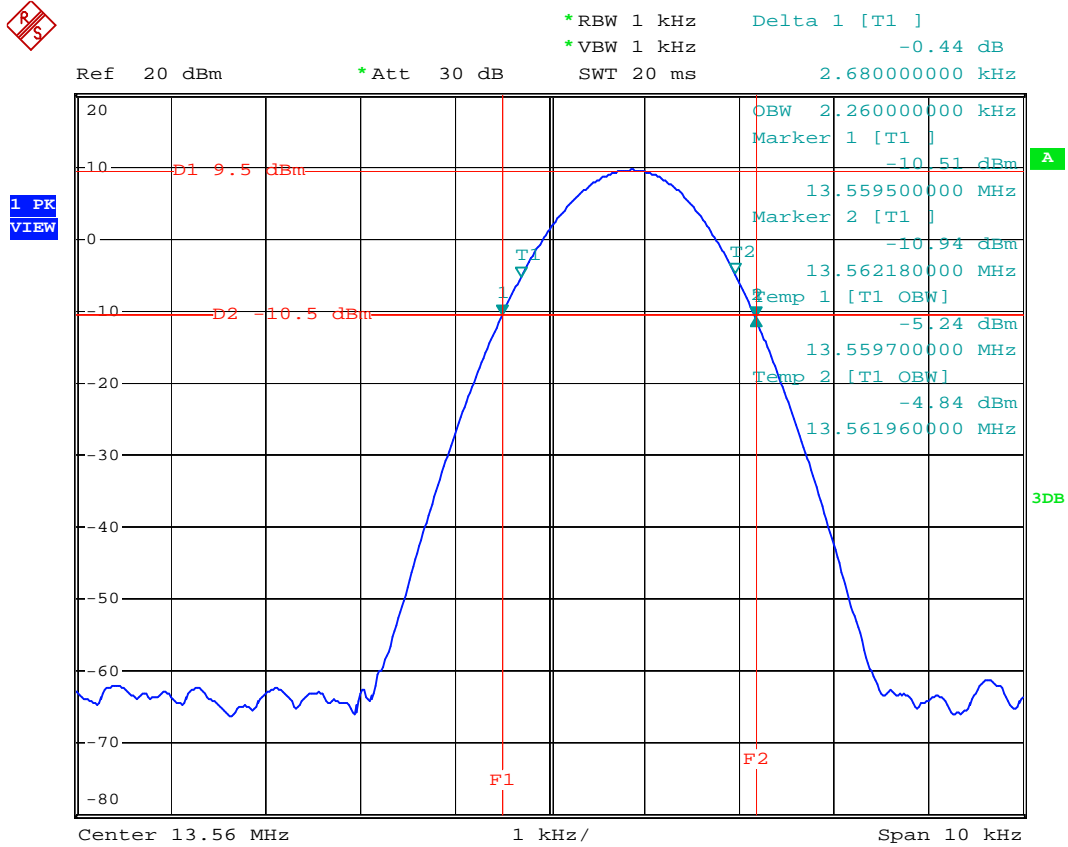
The EUT was programmed to be in continuously transmitting mode.

3.3.7 Test Result of 20dB Spectrum Bandwidth

Final Test Date	Sep. 06, 2011	Test Site No.	TH01-HY
Temperature	27.8°C	Humidity	45%
Test Engineer	Ian	Configurations	Ch. 1

Frequency	20dB BW (kHz)	99% OBW (kHz)	Frequency range (MHz) f _L > 13.553MHz	Frequency range (MHz) f _H < 13.567MHz	Test Result
13.56 MHz	2.68	2.26	13.5595	13.5622	Complies

20 dB/99% Bandwidth Plot on 13.56 MHz



Date: 6.SEP.2011 10:50:59

3.4 Radiated Emissions Measurement

3.4.1 Limit

The field strength of any emissions which appear outside of 13.553 ~ 13.567MHz band shall not exceed the general radiated emissions limits in Section 15.209(a)

Frequencies (MHz)	Field Strength (micровolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

3.4.2 Measuring Instruments and Setting

Please refer to section 4 of equipments list in this report. The following table is the setting of receiver.

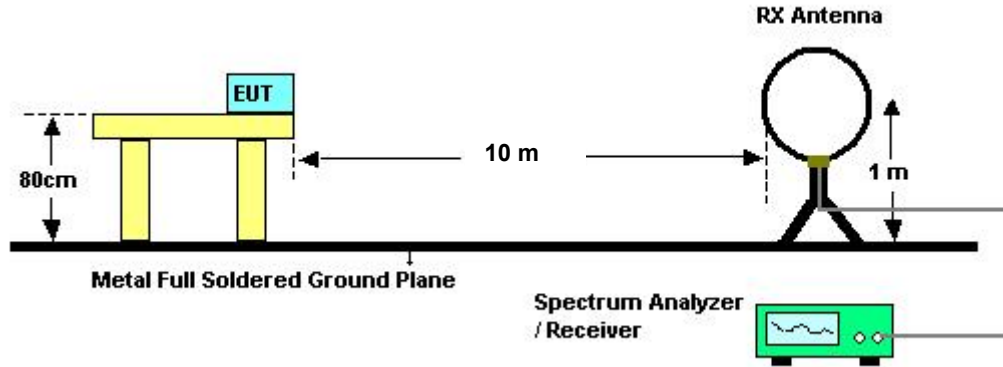
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.3 Test Procedures

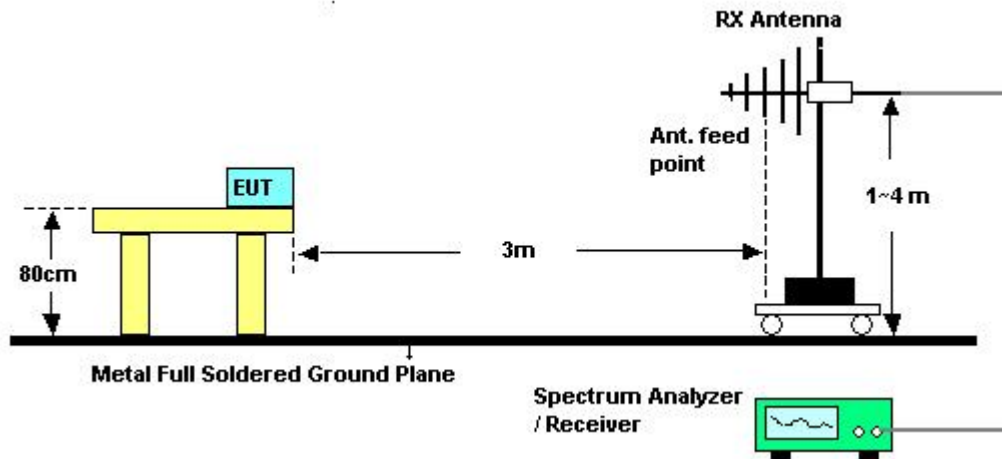
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
7. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

3.4.4 Test Setup Layout

For radiated emissions below 30MHz



For radiated emissions above 30MHz



3.4.5 Test Deviation

There is no deviation with the original standard.

3.4.6 EUT Operation during Test

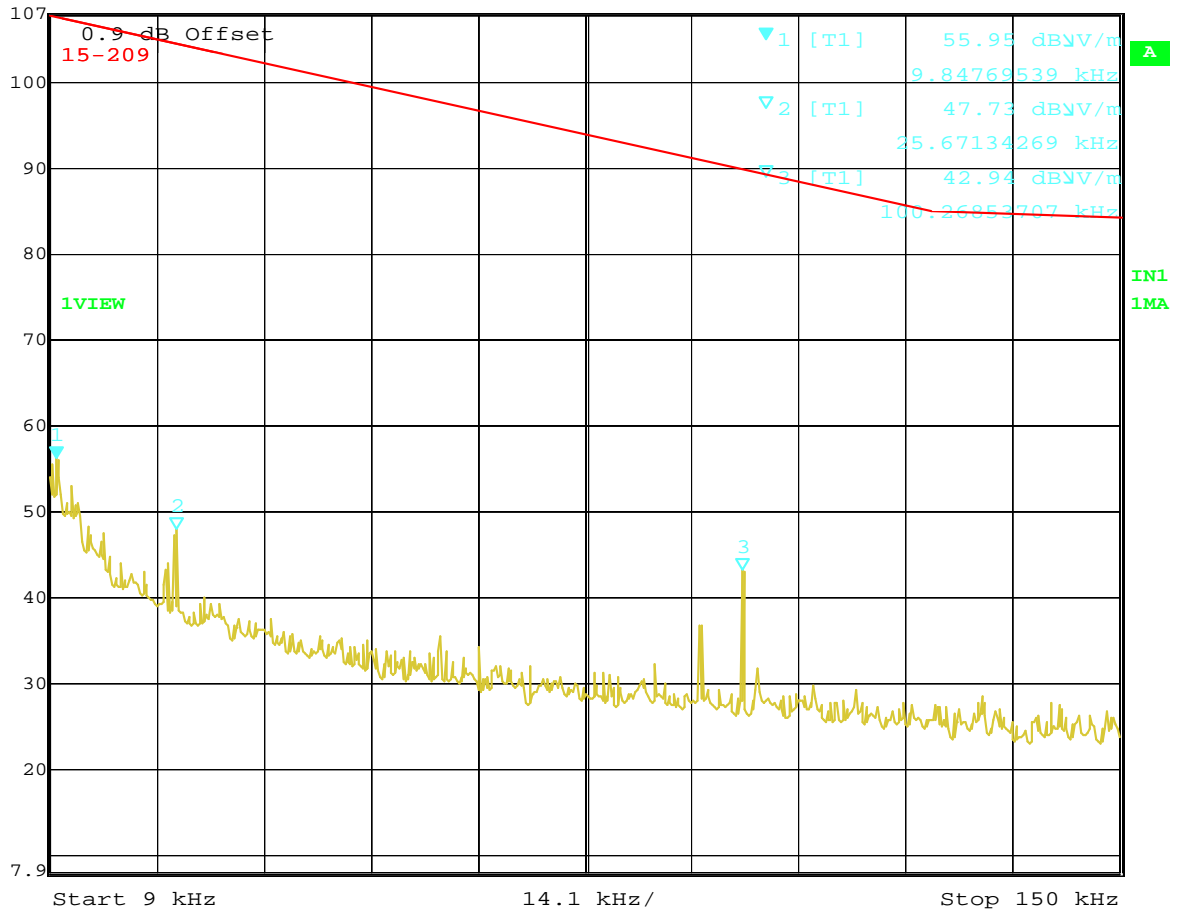
The EUT was programmed to be in continuously transmitting mode.

3.4.7 Results of Radiated Emissions (9kHz~30MHz)

Final Test Date	Jan. 16, 2012	Test Site No.	10CH02-HY
Temperature	21.2°C	Humidity	66%
Test Engineer	Streak	Configurations	Ch. 1

9KHz~150KHz

	Ref Lvl	107.9 dB*	Marker 1 [T1]	55.95 dBµV/m	RBW	200 Hz	RF Att	0 dB
				9.84769539 kHz	VBW	200 Hz		
					SWT	18 s	Unit	dBµV/m

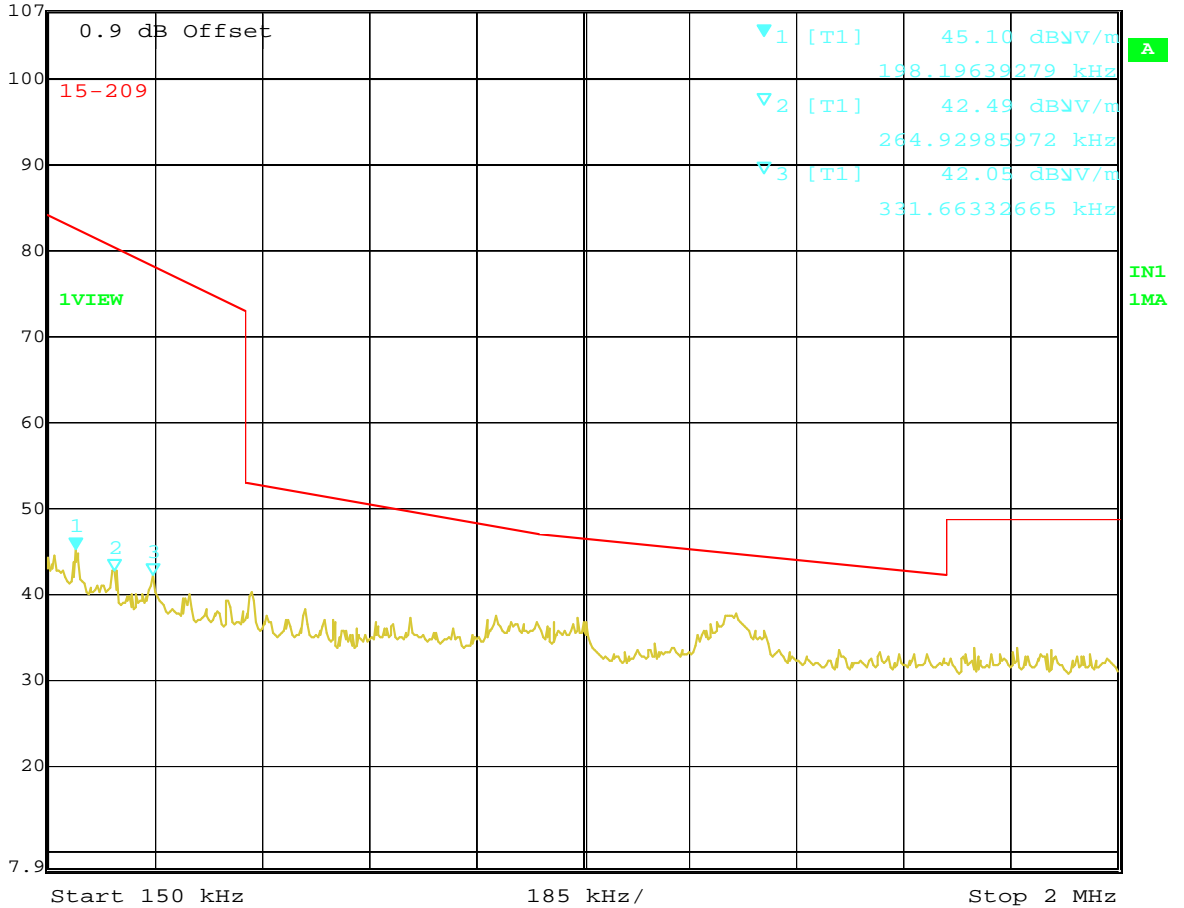


Date: 16.JAN.2012 20:30:49

150KHz~2MHz



Ref Lvl 107.9 dB*
 Marker 1 [T1] 45.10 dBµV/m
 198.19639279 kHz
 RBW 10 kHz RF Att 0 dB
 VBW 10 kHz
 SWT 47 ms Unit dBµV/m

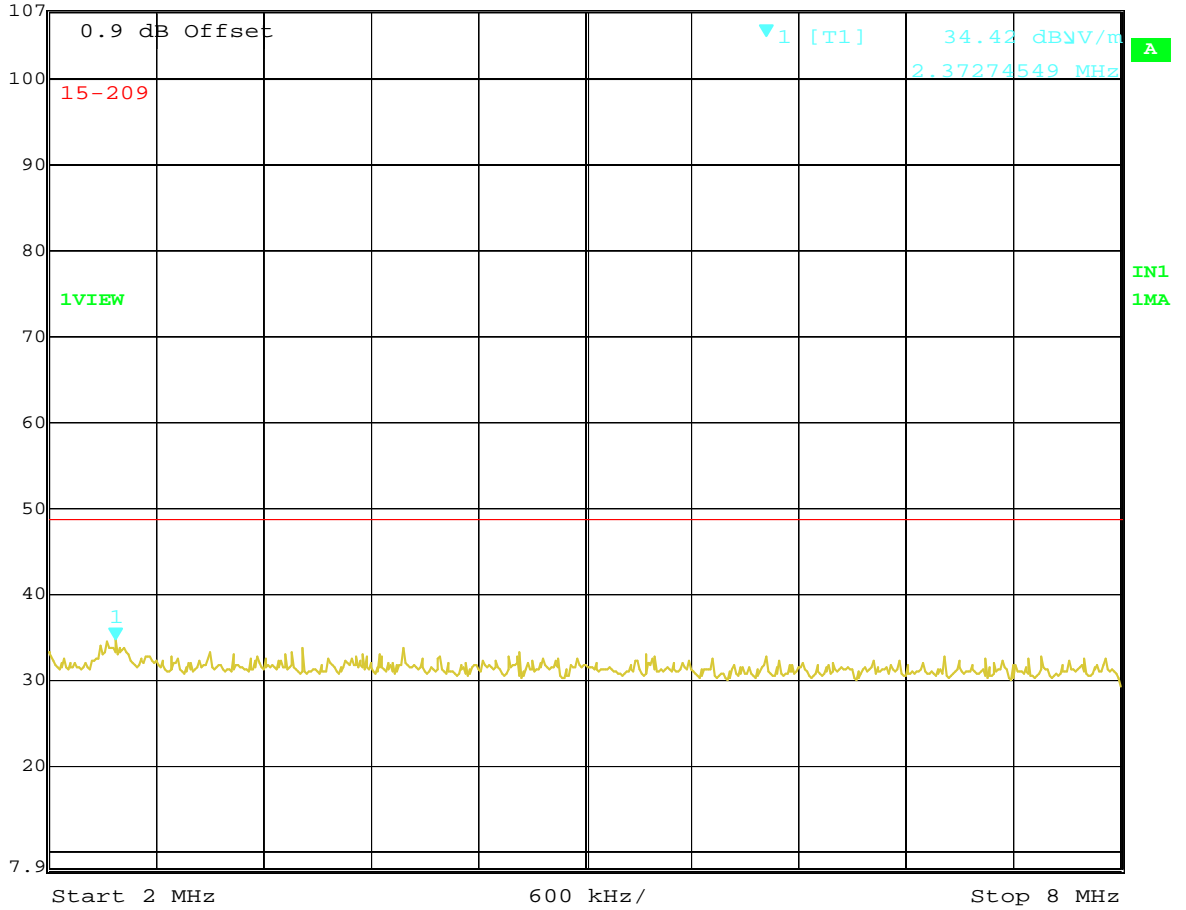


Date: 16.JAN.2012 20:34:48

2MHz~8MHz



Marker 1 [T1] RBW 10 kHz RF Att 0 dB
 Ref Lvl 34.42 dBµV/m VBW 10 kHz
 107.9 dB* 2.37274549 MHz SWT 150 ms Unit dBµV/m

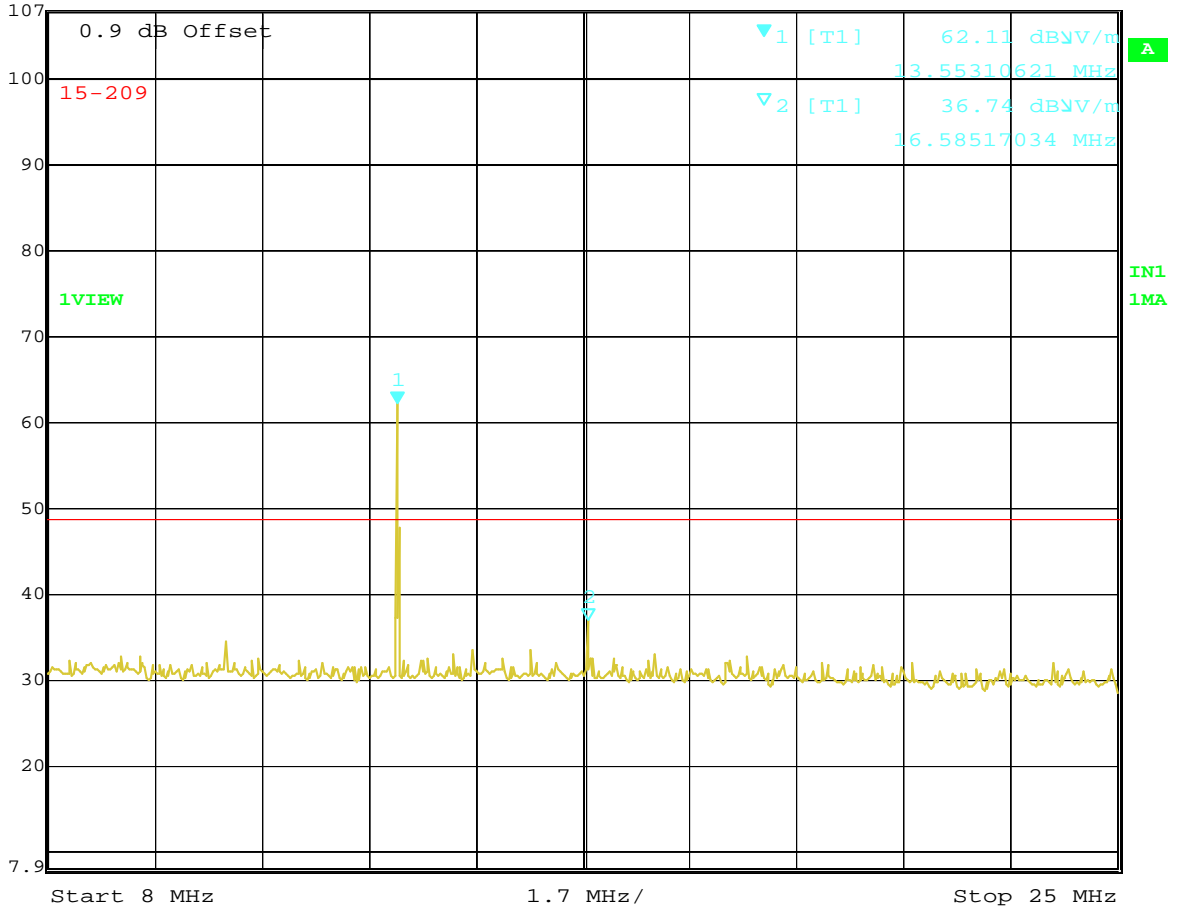


Date: 16.JAN.2012 20:38:21

8MHz~25MHz



Marker 1 [T1] RBW 10 kHz RF Att 0 dB
Ref Lvl 62.11 dB μ V/m VBW 10 kHz
107.9 dB* 13.55310621 MHz SWT 430 ms Unit dB μ V/m

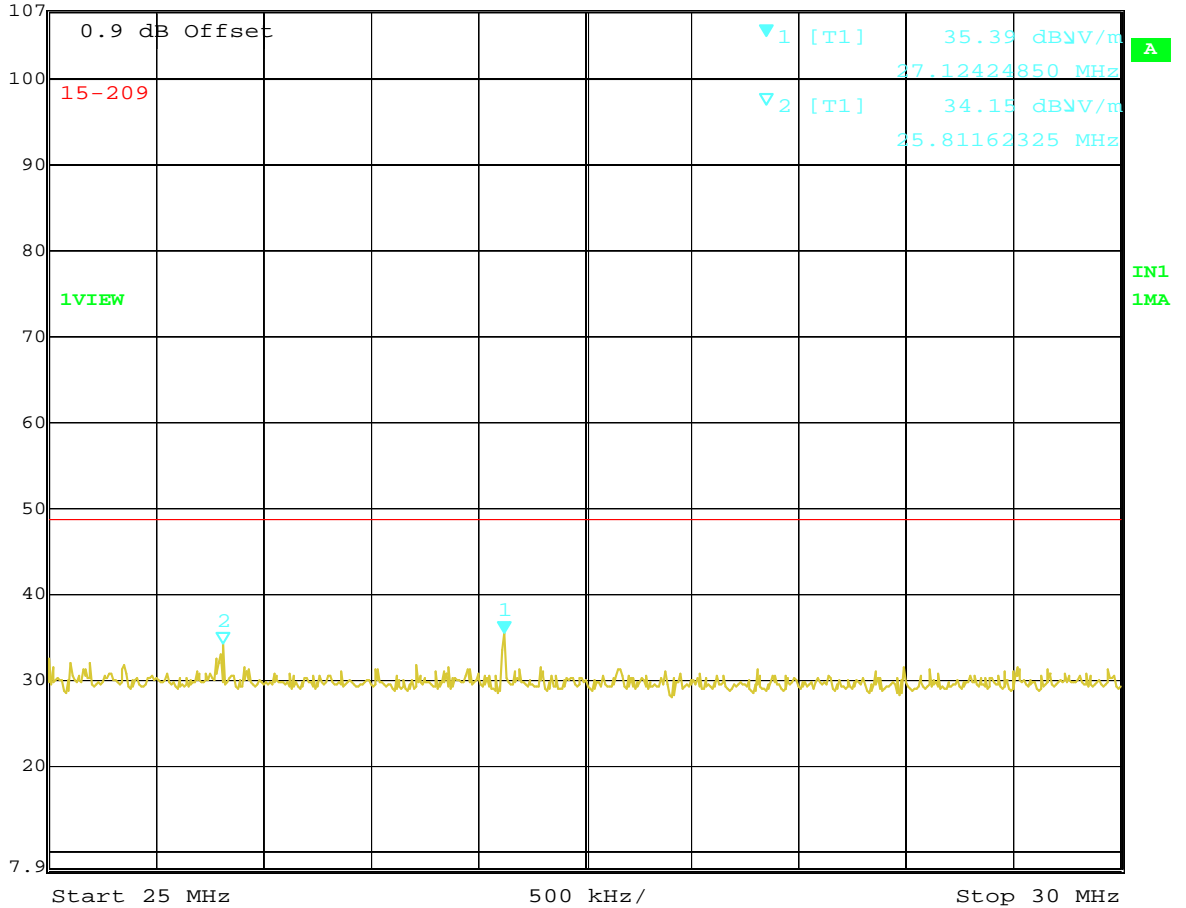


Date: 16.JAN.2012 20:48:52
Note: A mark 1 is Fundamental Emissions.

25MHz~30MHz



Ref Lvl 107.9 dB*
 Marker 1 [T1] 35.39 dBµV/m
 27.12424850 MHz
 RBW 10 kHz RF Att 0 dB
 VBW 10 kHz
 SWT 125 ms Unit dBµV/m



Date: 16.JAN.2012 20:51:07

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

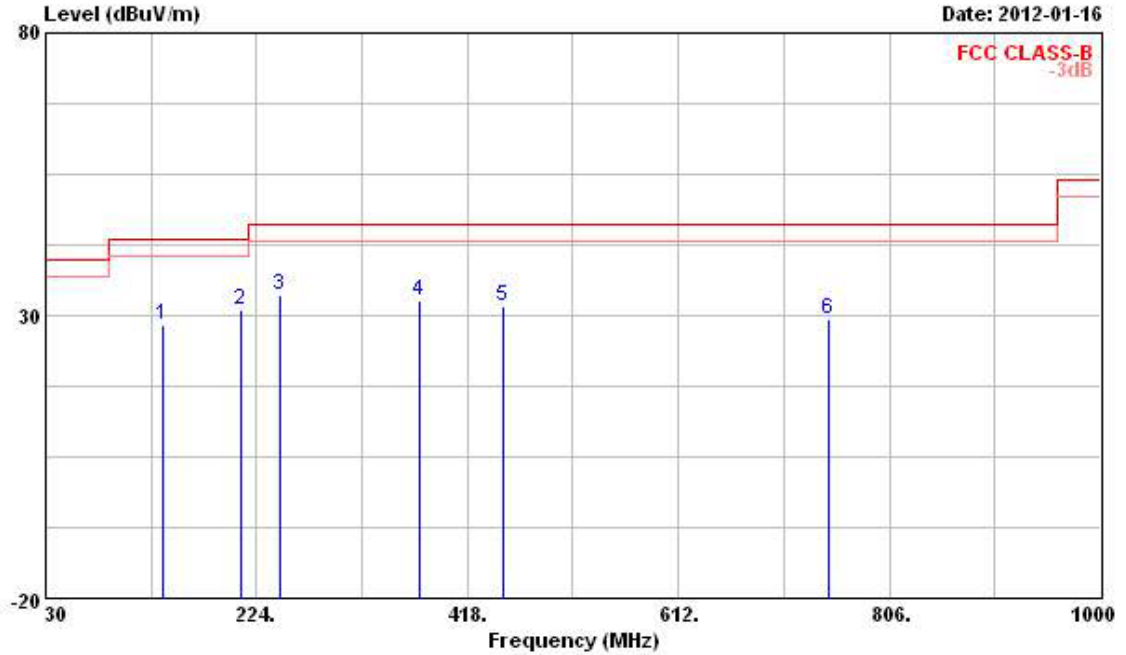
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

Limit line = specific limits (dBuV) + distance extrapolation factor.

3.4.8 Results for Radiated Emissions (30MHz~1GHz)

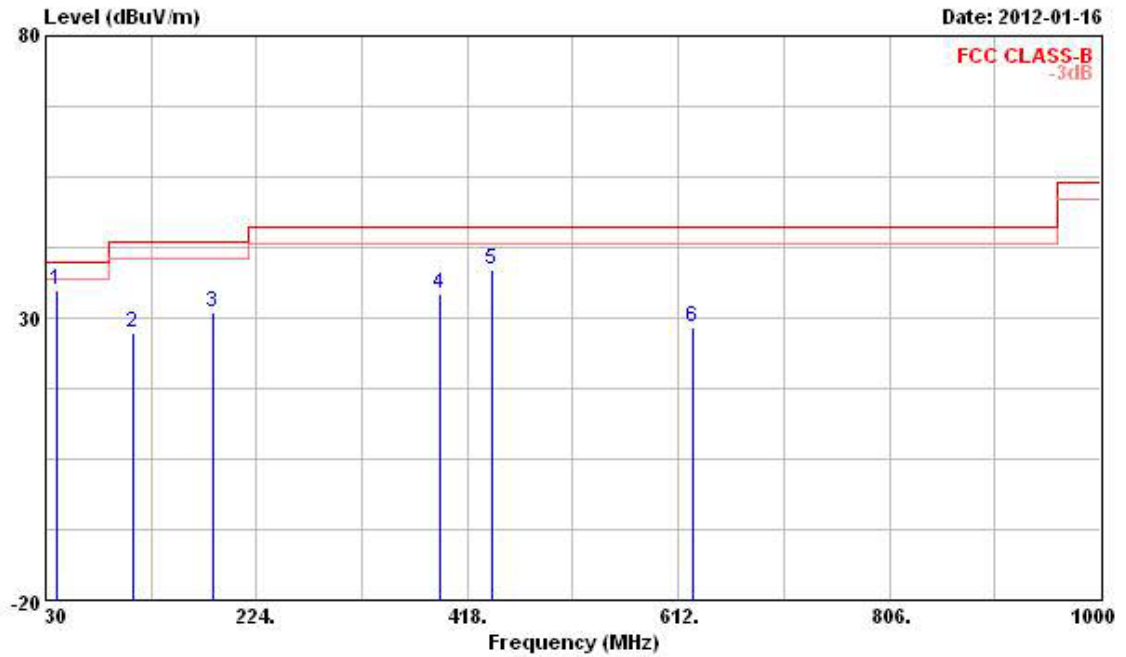
Final Test Date	Jan. 16, 2012	Test Site No.	10CH02-HY
Temperature	21.2°C	Humidity	66%
Test Engineer	Streak	Configurations	Ch.1 (AC Adapter 1 / CAE036092)

Horizontal



	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	137.670	28.37	-15.13	43.50	41.89	12.18	1.98	27.68	Peak	---	---
2	210.420	30.90	-12.60	43.50	44.08	11.70	2.50	27.38	Peak	---	---
3	245.340	33.57	-12.43	46.00	45.29	12.84	2.74	27.30	Peak	---	---
4	374.350	32.58	-13.42	46.00	42.12	14.86	3.29	27.69	Peak	---	---
5	450.980	31.58	-14.42	46.00	39.84	16.29	3.58	28.13	Peak	---	---
6	749.740	29.27	-16.73	46.00	33.12	19.55	4.71	28.11	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	39.700	34.94	-5.06	40.00	48.56	13.25	1.03	27.90	Peak	---	---
2	110.510	27.22	-16.28	43.50	40.81	12.46	1.75	27.80	Peak	---	---
3	183.260	30.87	-12.63	43.50	45.93	10.12	2.30	27.48	Peak	---	---
4	392.780	34.24	-11.76	46.00	43.54	15.15	3.37	27.82	Peak	---	---
5	440.310	38.58	-7.42	46.00	47.04	16.08	3.54	28.08	Peak	---	---
6	625.580	28.39	-17.61	46.00	32.64	19.84	4.32	28.41	Peak	---	---

Note:

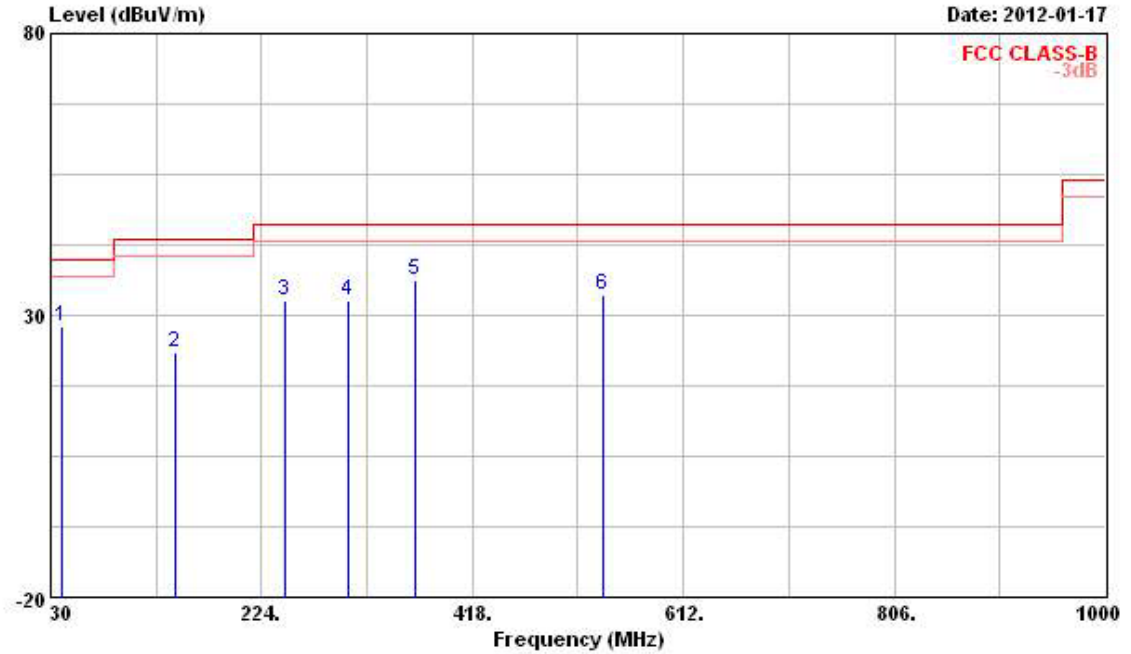
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

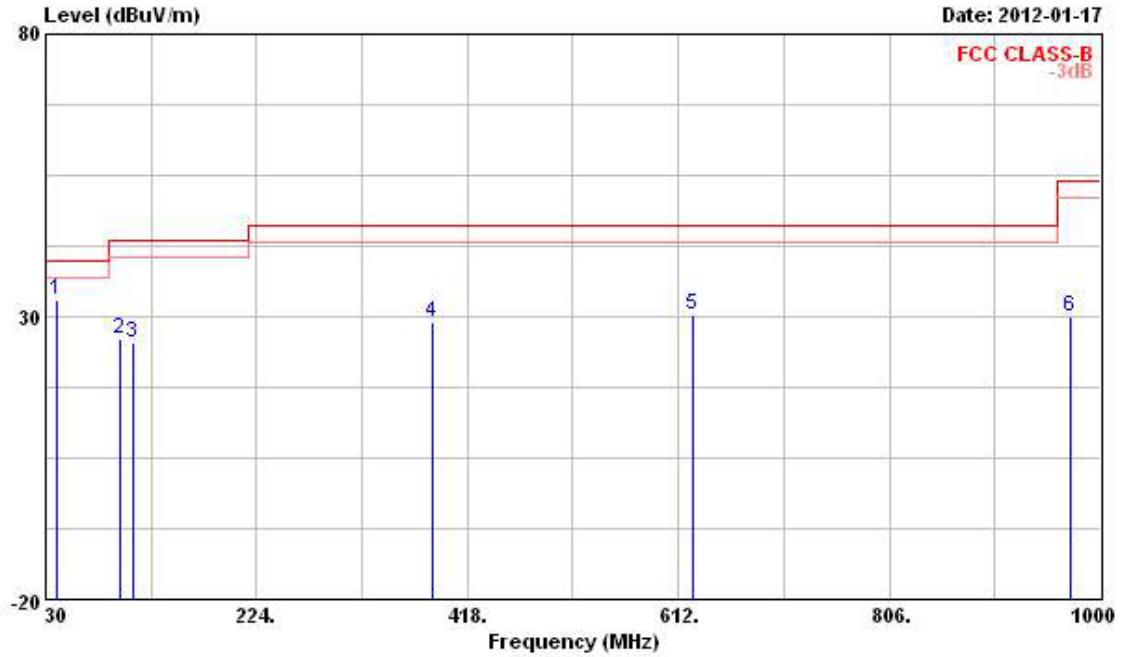
Final Test Date	Jan. 16, 2012	Test Site No.	03CH02-HY
Temperature	21.2°C	Humidity	66%
Test Engineer	Streak	Configurations	Ch.1 (AC Adapter 2 / SM09003A)

Horizontal



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	39.700	28.18	-11.82	40.00	41.80	13.25	1.03	27.90	Peak	---	---
2	145.430	23.32	-20.18	43.50	37.69	11.27	2.01	27.65	Peak	---	---
3	245.340	32.60	-13.40	46.00	44.32	12.84	2.74	27.30	Peak	---	---
4	304.510	32.60	-13.40	46.00	43.03	13.78	2.98	27.19	Peak	---	---
5	365.620	36.37	-9.63	46.00	46.03	14.72	3.25	27.63	Peak	---	---
6	537.310	33.47	-12.53	46.00	39.53	18.35	3.99	28.40	Peak	---	---

Vertical



	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1 @	39.700	32.95	-7.05	40.00	46.57	13.25	1.03	27.90	Peak	---	---
2	97.900	26.08	-17.42	43.50	41.45	10.84	1.64	27.85	Peak	---	---
3	110.510	25.26	-18.24	43.50	38.85	12.46	1.75	27.80	Peak	---	---
4	385.020	28.90	-17.10	46.00	38.31	15.03	3.33	27.77	Peak	---	---
5	625.580	30.22	-15.78	46.00	34.47	19.84	4.32	28.41	Peak	---	---
6	971.870	29.94	-24.06	54.00	29.88	21.80	5.59	27.33	Peak	---	---

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

Emission level (dBuV/m) = 20 log Emission level (uV/m).

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

3.5 Frequency Stability Measurement

3.5.1 Limit

The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% (100ppm) of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

3.5.2 Measuring Instruments and Setting

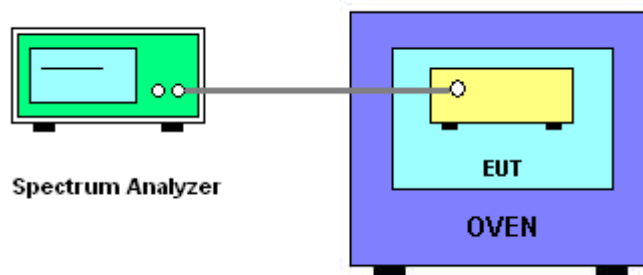
Please refer to section 4 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Entire absence of modulation emissions bandwidth
RB	1 kHz
VB	1 kHz
Sweep Time	Auto

3.5.3 Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 1 kHz, VBW = 1 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is $(fc-f)/fc \times 10^6$ ppm and the limit is less than ± 100 ppm.
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature rule is -20°C~50°C.

3.5.4 Test Setup Layout



3.5.5 Test Deviation

There is no deviation with the original standard.

3.5.6 EUT Operation during Test

The EUT was programmed to be in continuously un-modulation transmitting mode.

3.5.7 Test Result of Frequency Stability

Final Test Date	Sep. 06, 2011	Test Site No.	TH01-HY
Temperature	27.8°C	Humidity	45%
Test Engineer	Ian	Configurations	Ch. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	13.56 MHz
126.5	13.560860
110	13.560800
93.5	13.560880
Max. Deviation (MHz)	0.000880
Max. Deviation (ppm)	64.8968

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	13.56 MHz
-20	13.560893
-10	13.560889
0	13.560877
10	13.560862
20	13.560855
30	13.560864
40	13.560892
50	13.560943
Max. Deviation (MHz)	0.000943
Max. Deviation (ppm)	69.5575

3.6 Antenna Requirements

3.6.1 Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited.

3.6.2 Antenna Connector Construction

Please refer to section 2.1 in this test report; antenna connector complied with the requirements.

4. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	R&S	ESCS 30	100174	9 kHz ~ 2.75 GHz	Apr. 20, 2011	Conduction (CO04-HY)
LISN	SCHWARZBECK MESS-ELEKTRONIK	NSLK 8127	8127-477	9kHz – 30MHz	Jan. 17, 2011	Conduction (CO04-HY)
LISN (Support Unit)	EMCO	3810/2NM	9703-1839	9 kHz ~ 30 MHz	May 04, 2011	Conduction (CO04-HY)
RF Cable-CON	HUBER+SUHNER	RG213/U	CB049	9 kHz ~ 30 MHz	Apr. 21, 2011	Conduction (CO04-HY)
EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP 30	100023	9KHz ~ 30GHz	Mar. 15, 2011	Conducted (TH01-HY)
Temp. and Humidity Chamber	Giant Force	GTH-225-20-S	MAB0103-001	N/A	Oct. 22, 2010	Conducted (TH01-HY)
RF CABLE-1m	Jye Bao	RG142	CB034-1m	20MHz ~ 7GHz	Dec. 02, 2010	Conducted (TH01-HY)
RF CABLE-2m	Jye Bao	RG142	CB035-2m	20MHz ~ 1GHz	Dec. 02, 2010	Conducted (TH01-HY)
Signal Generator	R&S	SMR40	100116	10MHz ~ 40GHz	Jun. 07, 2011	Conducted (TH01-HY)
Power Sensor	Anritsu	MA2411B	0917017	300MHz~40GHz	Jan. 06, 2011	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
AC Power Source	HPC	HPA-500W	HPA-9100024	AC 0 ~ 300V	Jun. 09, 2011*	Conducted (TH01-HY)

Note: Calibration Interval of instruments listed above is two year.

For Radiated emissions 9kHz~30MHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
10m Semi Anechoic Chamber	TDK	SAC-10M	10CH02-HY	30 MHz ~ 1 GHz 10m,3m	Nov. 05, 2011	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10827	100KHz – 1.3GHz	May 20, 2011	Radiation (10CH02-HY)
Amplifier	AGILENT	8447D	2944A10828	100KHz – 1.3GHz	May 16, 2011	Radiation (10CH02-HY)
Receiver	R&S	ESI	838496/008	20Hz - 7GHz	Apr. 24, 2011	Radiation (10CH02-HY)
Spectrum Analyzer	R&S	FSP7	100645	9KHz – 7GHz	Jun. 01.2011	Radiation (10CH02-HY)
Biconical Antenna	Schwarzbeck	VHBB 9124	287	30 MHz ~ 200 MHz	Dec. 17, 2011	Radiation (10CH02-HY)
Log Antenna	Schwarzbeck	VUSLP 9111	207	200 MHz ~ 1 GHz	Dec. 17, 2011	Radiation (10CH02-HY)
Turn Table	HD	DS 430	430/360	0 ~ 360 degree	N/A	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/664	1 m - 4 m	N/A	Radiation (10CH02-HY)
Antenna Mast	HD	MA240	240/667	1 m - 4 m	N/A	Radiation (10CH02-HY)
RF Cable-R10m	Jye Bao	RG142	CB027-INSIDE	30MHz~1GHz	Feb. 12, 2011	Radiation (10CH02-HY)
RF Cable-R10m	Suhner Switzerland + BELDEN	RG223/U + RG8/U	CB026-DOOR	30MHz~1GHz	Feb. 12, 2011	Radiation (10CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

For Radiated emissions 30MHz~1GHz

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Spectrum Analyzer	R&S	FSP40	100305/040	9 kHz ~ 40 GHz	Feb. 11, 2011	Radiation (03CH02-HY)
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH02-HY	30 MHz ~ 1 GHz 3m	May 11, 2011	Radiation (03CH02-HY)
Amplifier	Agilent	8447D	2944A11146	100 kHz ~ 1.3 GHz	Jul. 25, 2011	Radiation (03CH02-HY)
RF Cable-R03m	Jye Bao	RG142	CB021	30 MHz ~ 1 GHz	Mar. 07, 2011	Radiation (03CH02-HY)
Bilog Antenna	SCHAFFNER	CBL61128	2723	30 MHz ~ 2 GHz	Oct. 22, 2011	Radiation (03CH02-HY)
Turn Table	HD	DS 420	420/649/00	0 - 360 degree	N/A	Radiation (03CH02-HY)
Antenna Mast	HD	MA 240	240/559/00	1 m - 4 m	N/A	Radiation (03CH02-HY)

Note: Calibration Interval of instruments listed above is one year.

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Loop Antenna	R&S	HFH2-Z2	860004/001	9 kHz - 30 MHz	Jul. 29, 2010*	Radiation (10CH02-HY) (03CH02-HY)

Note: Calibration Interval of instruments listed above is two year.

5. TEST LOCATION

SHIJR	ADD : 6Fl., No. 106, Sec. 1, Shintai 5th Rd., Shijr City, Taipei, Taiwan 221, R.O.C. TEL : 886-2-2696-2468 FAX : 886-2-2696-2255
HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-318-0055
LINKOU	ADD : No. 30-2, Dingfu Tsuen, Linkou Shiang, Taipei, Taiwan 244, R.O.C TEL : 886-2-2601-1640 FAX : 886-2-2601-1695
DUNGHU	ADD : No. 3, Lane 238, Kangle St., Neihu Chiu, Taipei, Taiwan 114, R.O.C. TEL : 886-2-2631-4739 FAX : 886-2-2631-9740
JUNGHE	ADD : 7Fl., No. 758, Jungjeng Rd., Junghe City, Taipei, Taiwan 235, R.O.C. TEL : 886-2-8227-2020 FAX : 886-2-8227-2626
NEIHU	ADD : 4Fl., No. 339, Hsin Hu 2 nd Rd., Taipei 114, Taiwan, R.O.C. TEL : 886-2-2794-8886 FAX : 886-2-2794-9777
JHUBEI	ADD : No.8, Lane 728, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085

6. TAF CERTIFICATE OF ACCREDITATION



Certificate No. : L1190-110111

財團法人全國認證基金會
Taiwan Accreditation Foundation

Certificate of Accreditation

This is to certify that

Sporton International Inc.

EMC & Wireless Communications Laboratory

No.52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien,
Taiwan, R.O.C.

is accredited in respect of laboratory

- Accreditation Criteria** : ISO/IEC 17025:2005
- Accreditation Number** : 1190
- Originally Accredited** : December 15, 2003
- Effective Period** : January 10, 2010 to January 09, 2013
- Accredited Scope** : Testing Field, see described in the Appendix
- Specific Accreditation Program** : Accreditation Program for Designated Testing Laboratory for Commodities Inspection
Accreditation Program for Telecommunication Equipment Testing Laboratory
Accreditation Program for BSMI Mutual Recognition Arrangement with Foreign Authorities

Jay-San Chen
President, Taiwan Accreditation Foundation
Date : January 11, 2011

P1, total 24 pages